of Good Hope and touched at the coast of south-east Africa, they found Arabs or Arab half-castes trading there, and learning that these called the black natives of the country "Kafirs," they adopted this term henceforth as the designation of the Bantu coast races of southern Africa, and passed on this word to the Dutch, who handed it over to the English. Mr. Kidd, by his excellent and detailed description of Kafir customs, myths, folklore, songs, dances, and implements, shows how inseparable these people are in classification from the Negro races of tropical Africa. This deduction is in varying degrees affected by an examination of South African Bantu languages. Of this subject Mr. Kidd does not treat at any length, but it might be mentioned that a careful study of such linguistic works as those of the late Dr. Bleek brings out the following points:—

A study of the existing languages of the Ova-herero of south-west Africa, of the many Bechuana tribes of central South Africa, and the languages of the Zulu-Kafirs from Cape Colony on the west and south to the Portuguese district of Inhambane (Nyambane) shows that there is fundamentally a common though remote parentage to these languages so far as the vocabulary and grammatical structure are concerned; that is to say, that there is more evidence of inter-relationship between these three groups than there is between any one of them and the Bantu languages to the north and north-east. But there are still very striking differences in phonology between the Herero, Bechuana, and Zulu groups, showing that the history and wanderings of each section must have differed considerably. The Bechuana languages are the most altered from the original Bantu structure, but they are without the clicks which seem to give a Hottentot aspect to the Zulu dialects, and I believe that very little that is Hottentot can be traced in the etymology of the Bechuana vocabulary. But the phonology of this language is so peculiar as to suggest its great isolation at one period from other Bantu dialects. Some students of Bantu languages, however, have thought that the Bechuana races may have been the pioneers of the Bantu invasion into the regions across the Zambezi.

Physically speaking, the various sections of the Bechuana people exhibit far more traces of intermixture with the Hottentot-Bushmen type than is shown by the Zulu-Kafirs or by the real Herero (Damara) people.[1] The languages of the Herero group, though they possess marked characteristics in phonology, are of a very pure Bantu type, and gradually link up northwards with the languages of the Congo coast and with the Bantu speech of the southern portions of the Congo basin. The Zulu language retains some primitive characteristics in the form of the prefixes, which have been changed or lost in the Bechuana or Herero groups. Yet in other respects the Zulu dialects have departed widely from the Bantu standard, especially in vocabulary. This language group is a curious mixture of archaic Bantu features and inexplicable elements which, if not "Non-Bantu," cannot be definitely traced to any known Bantu group of tongues. In a few cases words of this description are of Hottentot origin, but this does not explain many of them, which would appear to have been absolutely invented by the Zulu people, no doubt owing to that strange custom (by no means unknown elsewhere in Africa), of "hlonipa," by which a constant local change of vocabulary takes place owing to the dislike to mentioning names of things which resemble the names of relatives; so that if there be a prominent person in the tribe, for instance, whose name is actually equivalent to "ox," or even whose name sounds like the word for ox, in that village or community the ox will henceforth be known by a paraphrase or by a substituted word.

In many respects—as Mr. Kidd's work shows over and over again—the Zulu-Kafir race would seem to have been the last arrived of the Bantu peoples in southern Africa, and to have reached that part of the continent at no very remote period—possibly not more than 1,500 to 2,000 years ago. In some of their characteristics the Zulus irresistibly recall the manners and customs of such Nilotic-Negro races as the Masai, though there is absolutely no linguistic connection between the two peoples. No doubt this can be explained by assuming that the original Bantu group from which the Zulu sprang had sent several previous branches to invade South Africa, which may have been the originators of some of the Zambezi tribes, of the Bechuana and the Herero, and that in this original home, somewhere up in east-central Africa, the Zulu peoples came into contact with Nilotic-Negro races from whom they borrowed customs, arms, and methods of warfare, and with whom they shared religious beliefs. When the Zulus started forth on their southward migration their progress seems to have been a relatively rapid one. We need not be astonished at this when we reflect on the remarkable speed with which a small section of the Zulu people in the first decades of the nineteenth century rushed back into Central Africa, reaching in their raids and settlements even the vicinity of the Victoria Nyanza.

The author has much to say of interest on the vexed question of the clicks in Zulu. There are three clicks in this Bantu language—the only Bantu form of speech which possesses these sounds. Some have considered that they were borrowed from the Hottentot, but of late there has been a tendency on the part of students like Mr. Dudley Kidd and Miss A. Werner to argue that these modern clicks in Zulu have been separately developed without Hottentot parentage. Mr. Kidd points out that at the present day the clicks subsist far more in the language of the women than in that of the men. It should be noted that amongst the settlements of Zulus in east-central Africa, which are about seventy years old, the clicks are rapidly disappearing. Dr. Bleek pointed out in his linguistic studies that certain strong intercalated aspirates met with in Swahili, and in one or two other East African Bantu dialects were not dissimilar to a vanishing click.

The space at my disposal does not permit of my dealing further with the interesting problems raised by this book, which, however, I must repeat, is perhaps quite the best that has yet been written or compiled about the Bantu negroes of South Africa. The hundred plates that illustrate this book are all photographs of perfect execution and singular aptness.

H. H. JOHNSTON.

PROF. E. J. MAREY.

OF the two veteran Frenchmen who entered on their careers as physiological discoverers half a century ago, Marey and Chauveau, the first has left us. The second is in full vigour and is at this moment engaged in active laboratory work.

Marey died on Sunday night after an illness of much suffering. His earliest investigations had for their purpose the devising of methods by which the arterial pulsations could be made to inscribe themselves on an equably moving surface so as to obtain a graphic record from which their time-relations could be determined. One of the earliest products of these

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[1] Except of course the Hill Damaras, who are a mysterious tribe of mountain people in the northern parts of German South-west Africa—a black race similar in appearance to some of the more degraded Negro tribes of West Africa, but speaking a corrupt dialect of Hottentot.

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methods was the invention of the sphygmograph, of which the original form (1863) has not undergone any important modification. From the arteries he proceeded to the heart, and for this associated himself with Chauveau, with whom his early friendship persisted unbroken to the end. It was to this association of two able men, one of whom was at that time the most skilful of living experimenters, while the other possessed an equally exceptional faculty of mechanical invention, that we may attribute the splendid researches on which our present knowledge of the motion of the heart is founded.

The results of these investigations were communicated to the Academy of Sciences in the early 'sixties, and soon after published in Marey's first book ("Physiologie Médicale de la Circulation du Sang") in 1863. This work was followed by others, of which were the "Travaux du Laboratoire," published annually by M. Marey after he had succeeded Bernard as professor in the Collège de France. In these he completed the development of the "graphic method" in its relation to the circulation, and extended its application to other bodily movements, particularly to those of locomotion, including the flight of birds. It thus happens that the "kinematographic" method, which in later times has not only been vulgarised for public entertainment, but has served a higher purpose as a guide in the artistic representation of animal motion, was in the first instance devised by Marey for the purpose of physiological research.

It would be difficult to over-estimate the value of Marey's work to the science to which, for the last half-century, he has devoted himself. Full of original ideas and fruitful in resources for carrying them into effect, his ingenious methods have not only served his own purposes, but have been made available by other workers in all investigations relating to the mechanical functions of the animal body. It would be difficult to find a single instance of a research in the carrying out of which these methods have not been employed.

PROF. WILHELM HIS.

PROF. WILHELM HIS, whose death was announced from Leipzig on May 1, at the age of seventy-three, altered and extended our knowledge of human anatomy more than any man of his time. He discovered and wrote the history of the human body during the first and second months of conception, and thus filled in what, until his time, was almost a blank. He introduced more accurate methods of studying the form and relationships of the various organs of the body. Pupils went to him from all parts of the earth and carried back to their native universities the quiet, honest spirit of investigation, the complete methods and the accurate technique His had introduced in his laboratory at Leipzig. His influence to-day is world-wide; it is especially evident in the remarkable progress in embryological research made recently in the United States.

As His entered to lecture one was struck by the absence of those bodily features one expects in a German professor. He was a Swiss by birth and education, having been born at Basel in 1831; in appearance he might have been an Englishman. His narrow, longish head, black hair, regular profile, long sallow face, and nervous temperament indicated his descent from a Celtic stock. He taught quietly, clearly, and concisely, illustrating his subject as he spoke by marvellous drawing on the blackboard. He relegated lady-students to the back-bench. Long after the university doors were shut, a light could be seen in the window of his private room, for to him work was also amusement.

His career as a medical student is interesting. It began at the University of Basel when he was eighteen, and finished there in 1854 when he was in his twenty-third year, but during that period he visited and worked at the Universities of Bern, Berlin, Würzburg, Vienna, and Prague, selecting what was best at each place. After graduating he studied in Paris. In 1857, then twenty-six, he succeeded Meissner as professor of anatomy and physiology in Basel, and commenced his life's work.

It is always a matter of the utmost interest to know the circumstances that determine the direction of a successful line of research. His, in his student days, while working at Würzburg with Virchow, then a young enthusiast, commenced and afterwards finished an investigation into the structure of the cornea of the eye, and in the early years of his professorship published, with Billroth, a research into the structure of lymphatic glands and allied bodies. A lecture which he heard Remak give in Berlin on the developments of glands was really the starting point of his embryological work. The point which struck him as marvellous was the development of a gland such as the liver from two of the three primary layers of the embryo. He commenced to investigate the origin and the part which each of these three primary layers played (ectoderm, mesoderm, and hypoderm) in the development of each part of the body, first in fowls and lower vertebrates, and subsequently in the then almost unknown early human embryo.

Every advance in science rests on the introduction of a new method. By the methods he employed His succeeded where other men had failed. The early human embryo is minute and jelly like; it has to be hardened and stained before it can be cut in microscopic sections; it has to be stained to differentiate its various constituent layers; it has to be cut with a mathematical regularity in order that each section may be magnified and modelled in wax so that, by placing these wax magnifications together, a reconstruction of the embryo may be obtained. Although His did not invent any one of these details, yet he improved each of them and applied them to the study of embryos with an accuracy that never has and never will be surpassed. Duplicates of the models thus constructed are to be seen in all anatomical museums, and are of the greatest service to those who teach as well as to those who pursue embryological research.

The work of Prof. His is not marked by brilliant generalisations or discoveries, nor can his outlook on the kingdom of living things be said to be a wide one. He represented most realistically what he saw, but his power of interpreting embryological facts was limited by his neglect of comparative anatomy. Perhaps the greatest of his discoveries was the manner in which nerve fibres are developed. He was the first to see that they were processes produced by nerve cells. If his limitations are mentioned, it must also be admitted that most of what we know of the early development of all the systems of the human body we owe to him.

Ludwig, who made Leipzig the Mecca of physiologists, early recognised the ability of the young Swiss anatomist, and was instrumental, in 1872, in having him appointed director and professor of anatomy in the University of Leipzig. During the thirty-two years he laboured there, the younger anatomists flocked to him, and by placing his time, advice, and encouragement freely at their disposal, he rendered them deeply his debtors.

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